PhytoKeys 201: 15–22 (2022)
doi: 10.3897/phytokeys.201.84699
https://phytokeys.pensoft.net

RESEARCH ARTICLE

A peer-reviewed open-access journal
PhytoKeys
Launched to accelerate biodiversity research

Typification of six names in *Camellia* (Theaceae)

Dongwei Zhao[1]

1 *Department of Forestry, College of Forestry, Central South University of Forestry and Technology, 498 Shaoshan South Road, Changsha, Hunan 410004, China*

Corresponding author: Dongwei Zhao (zhaodw@csuft.edu.cn)

Academic editor: Wendy Achmmad Mustaqim | Received 31 March 2022 | Accepted 3 June 2022 | Published 15 June 2022

Citation: Zhao D (2022) Typification of six names in *Camellia* (Theaceae). PhytoKeys 201: 15–22. https://doi.org/10.3897/phytokeys.201.84699

Abstract

Six names in *Camellia* or its synonym *Thea*, including *Camellia reticulata* f. *simplex*, *C. symplocifolia*, *Thea forrestii*, *T. lanceolata* var. *stenophylla*, *T. megacarpa* and *T. yunnanensis* are lectotypified here with nomenclatural and taxonomic notes provided.

Keywords

Camellia, lectotypification, *Thea*

Introduction

Species of *Camellia* L. (Theaceae) are of great economic value through the productions of tea and seed oil, as well as cultivation for their beautiful flowers. The genus has been taxonomically revised at least six times (e.g. global species: Sealy 1958; Chang 1981; Chang and Bartholomew 1984; Ming 2000; species in China: Chang 1998; Ming and Bartholomew 2007), but the types of many taxa remain unclear. Some of them have recently been typified (Zhao et al. 2017a, b, 2018, 2019; Zhao 2021, 2022). Following these works, six more names in the genus with similar problems are identified and they are lectotypified below.

Copyright *Dongwei Zhao*. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Materials and methods

Taxonomic literature, especially protologues, and specimens at Herbaria A, BM, E, G, K, KUN, L, MO, NY, P, PE, TCD, U and US (acronyms based on Thiers 2022, continuously updated) were examined. The most informative specimen was selected as the lectotype, based on Art. 9 of the Shenzhen Code (Turland et al. 2018, hereafter ICN).

Typification of names

1. *Camellia reticulata* Lindl. f. *simplex* Sealy, Revis. Gen. *Camellia* 183. (1958)

Lectotype. (designated here): China. Yunnan: Northeast of Tengyueh (Tengchong), 20°10'N, 6000 ft alt., March 1913, *G. Forrest 9715* (K!; Fig. 1).

Notes. Sealy (1958: 183) established the new form to represent the wild plants of *C. reticulata* since the latter was described based on a plant with semi-double flowers (Zhao 2022). A gathering, *Forrest 9715*, was designated as the type of the form. Sealy (1958: 182) cited "*Forrest 9715* (E, K)" on the page before the protologue, so the collection *Forrest 9715* at Herbaria E and K are syntypes of *C. reticulata* f. *simplex* (Art. 40 Note 1 of the ICN). A single sheet of *Forrest 9715* was found at E with barcode E00117770 (see http://data.rbge.org.uk/herb/E00117770). However, the single specimen of the collection at K bears Sealy's drawing of a flower and his notes on the morphology, so it is selected above as the lectotype of the form (Fig. 1).

Ming (2000: 278) recognised *C. reticulata* f. *simplex* as a heterotypic synonym of *C. reticulata*. Though the original material of the species was derived from the cultivated plant, the current broad circumscription for *C. reticulata* covers wild plants under the ICN since the nomenclatural type does not need to be the most typical or representative of a natural species (Art. 7.2 of the ICN). However, it is better to name cultivars according to the *International Code of Nomenclature for Cultivated Plants* (Art. 28 Note 2; Brickell et al. 2016).

2. *Camellia symplocifolia* Griff., Itin. Pl. Khasyah Mts. 40, No. 652. (1848)

Lectotype. (designated here): India. Khasya Hills, *W. Griffith s.n.* (TCD0018254!; Fig. 2).

Notes. Griffith (1848) described *C. symplocifolia* under his catalogue number 652 and stated that the original material was collected at Churra, Khasyah. Though "Icon no. 31" was cited in the protologue and this citation directs to a drawing, fig. 2 of plate DCIV ("*C. simplicifolia*") in *Icones Plantarum Asiaticarum* (Griffith 1854), the single drawing cannot be considered as the holotype because the corresponding specimens that were collected and used by Griffith to prepare the description, although uncited, may still exist (see Art. 9 Ex. 2 of the ICN). Furthermore, fig. 2 of plate DCIV (Griffith

Figure 1. Lectotype of *Camellia reticulata* Lindl. f. *simplex* Sealy (*G. Forrest 9715* at K). Photo: D.W. Zhao.

1854) is a poor drawing of leaves and flowers, which can hardly illustrate the key features of the taxon and is, therefore, unsuitable to serve as the lectotype. The specimens of potential original material collected by Griffith in Khasya Hills were found at BM, K and TCD. Unfortunately, none of the specimens bears the name "*C. symplocifolia*" or the catalogue number. Considering the name was published in Griffith's posthumous papers, it would be unsurprising that the original material of the name had not been clearly labelled. Based on the protologue and the drawing, one of the specimens, *Griffith s.n.* (TCD0018254; Fig. 2), with flower materials (e.g. flower buds, androecia and gynoecia) and barcoded, is selected above as the lectotype of *C. symplocifolia*. Additionally, the specimen (TCD0018254; Fig. 2) can be easily distinguished from *C. caudata* Wall. that was listed on the same page of Griffith (1848) by its subsessile flower buds and glabrous filaments, whereas the latter bears pedicellate flower buds and hairy filaments.

Camellia symplocifolia is treated as a heterotypic synonym of *C. kissi* Wall. by Sealy (1958: 197), Chang (1981: 35) and Ming (2000: 303). I agree with this treatment.

3. *Thea forrestii* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 284. (1912) ≡ *Camellia forrestii* (Diels) Cohen-Stuart

Lectotype. (designated here; first-step designated by Sealy 1958: 54): China. Yunnan: South end of Tsu-hsiong-fu (Chuxiong) Valley, 7000–8000 ft alt., February 1903, *G. Forrest 314* (E00284407!; its image is available at http://data.rbge.org.uk/herb/E00284407).

Notes. Diels (1912) cited a single gathering, *G. Forrest 314*, as the type of *T. forrestii* in the protologue. Cohen-Stuart (1916) transferred this species into *Camellia* without any comment on the type. However, three duplicates of *G. Forrest 314* were found at E (E00284407), K (K000380522) and P (P04511547), so they are syntypes of *T. forrestii* (Art. 40 Note 1 of the ICN). When Sealy (1958: 54) indicated "*Forrest 314* (E, K; type of *C. forrestii*)", such citation may act as the first-step lectotypification under Art 9.17 of the ICN. It is further narrowed to a single specimen at E (E00284407) here as the second-step lectotype of *T. forrestii*.

4. *Thea lanceolata* (Blume) Pierre var. *stenophylla* Merr., Enum. Philipp. Fl. Pl. 70 (1923).

Lectotype. (designated here): Philippines. Luzon: Ilocos Norte Province, Bangui to Claveria, August 1918, *M. Ramos 33005* (US 00113903 [the image is available at http://n2t.net/ark:/65665/34f38884f-74b3-4f15-8e0b-db0f884e39b1]!).

Notes. Merrill (1923: 70) cited a single collection, "*B.S. 33005 Ramos*" in the protologue without specifying the corresponding herbarium. Two duplicates of this gathering were found at K and US, so they are syntypes (Art. 40 Note 1 of the ICN) of *T. lanceolata* var. *stenophylla*. The specimen at US bearing barcode 00113903 is selected above as the lectotype of this taxon because a fragment of fruit is attached on a branchlet of the sheet.

Figure 2. Lectotype of *Camellia symplocifolia* Griff. (*Griffith s.n.*, TCD0018254). The red arrow indicates one position of the androecium and gynoecium. Image scanned by Ms J. Stone (TCD) and adapted by D.W. Zhao.

Due to a lack of materials, Sealy (1958: 145) did not give this variety a formal taxonomic treatment. Keng (1989: 68) identified it as a heterotypic synonym of *C. lanceolata* (Blume) Seem. and claimed that the latter was "understandably unlikely to be a homogeneous taxon" based on its widespread geographic distribution. I generally agree with Keng's (1989) broad circumscription of *C. lanceolata* until more data are available (see below).

5. *Thea megacarpa* Elmer, Leafl. Philipp. Bot. 5: 1842. (1913)

Lectotype. (designated here): Philippines. Palawan: Puerto Princesa (Mt. Pulgar), March 1911, *Elmer 12822* (E00504323!; its image is available at http://data.rbge.org.uk/herb/E00504323).

Notes. A single collection, *Elmer 12822*, was cited in the protologue (Elmer 1913: 1843) without indicating where the specimens were conserved. Ten duplicates of *Elmer 12822* housed at various Herbaria A (00025101), BM, E (E00504323), G (G00354856), K, MO (705490), NY (00385756), P (P04511437), U (U 0226169) and US (00113904) were found, so they are the syntypes of *T. megacarpa* (Art. 40 Note 1 of the ICN). The citation of Ming (2000: 228), "Type:... *A.D.E. Elmer 12822* (K, E, BM, P)", did not validate the lectotypification because the single herbarium in which the type was deposited was not specified (Art. 9.22 of the ICN). The specimen at E (E00504323), which bears immature fruit and seeds, is selected as lectotype.

Cohen-Stuart (1916: 68) transferred *Thea megacarpa* into *Camellia*. Sealy (1958: 142) treated it as a heterotypic synonym of *C. lanceolata*. Chang and Ren (1991: 68) thought that *Elmer 12822* "much differed from" *C. lanceolata* because the former bore "free filaments and [a] thicker pericarp", whereas the latter bore "totally united filaments" and a "thinner pericarp". However, flowers, including filaments, were absent in all the specimens of *Elmer 12822* examined above and there was no description of flower parts in the protologue (Elmer 1913: 1842–1843). Later, Ming (2000: 228) recognised the plant as a subspecies of *C. furfuracea* (Merr.) Cohen-Stuart.

However, as a native and the single representative of *Camellia* in the Malay Archipelago, *C. lanceolata* holds a specific phylogenetic position (Zhao et al. 2022). The plants under the broad circumscription of this taxon show a continuous variation in the size and shape of the morphological characters. For instance, the length of the leaf blade can vary from 2 cm (e.g. *Beaman 8977* at K) to 13 cm (e.g. the lectotype of *T. megacarpa*, *Elmer 12822* at E), but the elements of flower and fruit, such as the filament tube, the hairy ovary and the furfuraceous surface of the pericarp, are generally similar amongst them. Since there is no clear correlation between morphological variation and geographic distribution and molecular phylogenetic analysis of the plants is absent, I provisionally agree with the broad definition of *C. lanceolata* and place *T. lanceolata* var. *stenophylla* and *T. megacarpa* in its synonymy.

6. *Thea yunnanensis* Pit. ex Diels, Notes Roy. Bot. Gard. Edinburgh 5: 284. (1912) ≡ *Camellia yunnanensis* (Pit. ex Diels) Cohen-Stuart

Lectotype. (designated here; first-step designated by Sealy 1958: 163): China. Yunnan: Ta long tan, 10 October 1889, *Delavay s.n.* (P01903507!; its image is available at https://science.mnhn.fr/institution/mnhn/collection/p/item/p01903507).

Notes. Two gatherings, *Delavay s.n.* and *G. Forrest 430*, were cited in the protologue (Diels 1912: 284), so they are syntypes of *T. yunnanensis* (Art. 9.6 of the ICN). When Sealy (1958: 163) cited "*Delavay 15 Oct. 1889* (P, type)", his lectotypification must be accepted, but may be considered as the first-step (Art. 9.17 of the ICN) because three specimens of Delavay's collection matching the description of *T. yunnanensis* were found at P (P01903507, P01903508 and a single specimen consisting of two sheets: P06614716 [1/2] & P06614717 [2/2]; Art. 8.3 of the ICN, also see Ex. 7). However, the three specimens of *Delavay s.n.* were all collected on 10 October 1889 and two of them, P01903507 and P01903508, bear Pitard's handwriting "*Thea yunnanensis* sp. n.", so the date of collection recorded in the protologue, "15 October 1889", is probably incorrect and the correct date is 10 October 1889 which was recorded on the labels. Specimen with barcode P01903507 bears a drawing of a dissected flower and is designated above as the second-step lectotype of *T. yunnanensis* (Art. 9.17 of the ICN).

Acknowledgements

I thank the staff of the Herbaria mentioned above for making specimens and/or their images/photos available and two reviewers for their helpful comments. This work is supported by Hunan Provincial Natural Science Foundation of China (2022JJ40870).

References

Brickell CD, Alexander C, Cubey JJ, David JC, Hoffman MHA, Leslie AC, Malécot V, Jin XB (2016) International Code of Nomenclature for Cultivated Plants. Scripta Horticulturae 18. ISHS, 190 pp.

Chang HT (1981) A Taxonomy of the Genus *Camellia*. The Editorial Staff of the Journal of Sun Yatsen University, Guangzhou, 180 pp.

Chang HT (1998) Theaceae (1) Theoideae 1. *Camellia*. In: Delectis Florae Reipublicae Popularis Sinicae Agendae Academiae Sinicae Edita (Ed.) Flora Reipublicae Popularis Sinicae (Vol. 49[3]). Science Press, Beijing, 3–195.

Chang HT, Bartholomew B (1984) Camellias. Timber Press, London, 211 pp.

Chang HT, Ren SX (1991) New species of Theaceae from tropical Asia. Acta Scientiarum Naturalium Universitatis Sunyatseni 30: 67–71.

Cohen-Stuart CP (1916) Voorbereidende onderzoekingen ten dienste van de selektie der theeplant. Mededeelingen van het Proefstation voor Thee 40: 1–328.

Diels L (1912) Plantae Chinenses Forrestianae: New and imperfectly known species. Notes from the Royal Botanic Garden Edinburgh 5: 161–304.

Elmer ADE (1913) Four score of new plants. Leaflets of Philippine Botany 5: 1751–1853.

Griffith W (1848) Itinerary Notes of Plants Collected in the Khasyah and Bootan Mountains, 1837–38, in Affghanisthan and Neighbouring Countries, 1839 to 1841. Arranged by J. M'Clelland. Printed by Mr. J.F. Bellamy, Calcutta, 435 pp. https://doi.org/10.5962/bhl.title.70351

Griffith W (1854) Icones Plantarum Asiaticarum. Part IV, Diccotyledonous Plants. Arranged by J. M'Clelland. Printed by A.B. Coshan. https://doi.org/10.5962/bhl.title.63664

Keng H (1989) The genus *Camellia* (Theaceae) in Malesia, Florae Malesianae precursores – LVIII, part three. Gardens' Bulletin (Singapore) 42: 65–69.

Merrill ED (1923) An Enumeration of Philippine Flowering Plants (Vol. 3). Bureau of Printing, Manila, 628 pp. https://doi.org/10.5962/bhl.title.49412

Ming TL (2000) Monograph of the Genus *Camellia*. Yunnan Science and Technology Press, Kunming, 352 pp.

Ming TL, Bartholomew B (2007) Theaceae. In: Wu ZY, Raven PH, Hong DY (Eds) Flora of China, Vol. 12. Hippocastanaceae through Theaceae. Science Press, Beijing; Missouri Botanical Garden Press, St. Louis, 366–478.

Sealy JR (1958) A Revision of the Genus *Camellia*. The Royal Horticultural Society, London, 239 pp.

Thiers BM (2022) Index Herbariorum. http://sweetgum.nybg.org/science/ih/ [accessed 30 May 2022]

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber WH, Li DZ, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF (2018) International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten, 254 pp. https://doi.org/10.12705/Code.2018

Zhao DW (2021) Typification of *Camellia sasanqua* (Theaceae). Phytotaxa 491: 297–300. https://doi.org/10.11646/phytotaxa.491.4.5

Zhao DW (2022) Nomenclatural notes and typification of three synonyms of *Camellia* (Theaceae). PhytoKeys 193: 1–8. https://doi.org/10.3897/phytokeys.193.78810

Zhao DW, Hodkinson TR, Parnell JAN (2022) Phylogenetics of global *Camellia* (Theaceae) based on three nuclear regions and its implications for systematics and evolutionary history. Journal of Systematics and Evolution jse.12837. https://doi.org/10.1111/jse.12837

Zhao DW, Parnell JAN, Hodkinson TR (2017a) Names of Assam tea: Their priority, typification and nomenclatural notes. Taxon 66(6): 1447–1455. https://doi.org/10.12705/666.11

Zhao DW, Parnell JAN, Hodkinson TR (2017b) Typification of names in the genus *Camellia* (Theaceae). Phytotaxa 292(2): 171–179. https://doi.org/10.11646/phytotaxa.292.2.4

Zhao DW, Parnell JAN, Hodkinson TR (2018) Typification of names in *Camellia* (Theaceae), II. Phytotaxa 351(1): 93–95. https://doi.org/10.11646/phytotaxa.351.1.9

Zhao DW, Parnell JAN, Hodkinson TR (2019) Typification of names in *Camellia* (Theaceae), III. Phytotaxa 415(5): 298–300. https://doi.org/10.11646/phytotaxa.415.5.7